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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/652,677	08/29/2003	James E. Boyle	3816.04-D3	2556
22337	7590	08/25/2004	EXAMINER	
LAW OFFICES OF CHARLES GUENZER P O BOX 60729 PALO ALTO, CA 94306			OMGBA, ESSAMA	
			ART UNIT	PAPER NUMBER
			3726	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/652,677

Applicant(s)

BOYLE ET AL.

Examiner

Essama Omgba

Art Unit

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 7-10, 13-15, 17-20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemirowski et al. (US Patent 6,056,123) in view of Ohsawa (US Patent 6,033,215).

With regards to claims 1, 4, 10, 13-15, 19 and 20, Niemirowski et al. discloses a support tower for supporting wafers in parallel spaced relationship along a vertical axis and a method of fabricating the support tower, wherein a plurality of slots 5 are cut in each of a plurality of silicon legs 1 to form teeth therebetween, the plurality of silicon legs extending along a vertical axis, and opposite ends of the plurality of silicon legs are joined to respective ones of two silicon bases 2, see column 2, lines 19-21, 26-31, 61-67 and column 2, lines 1-20. Niemirowski et al. does not disclose the teeth being inclined at an angle between 1° and 3° and support surfaces extending perpendicularly to the vertical axis. However Ohsawa teaches such teeth, see figure 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have formed the teeth of the support tower of Niemirowski et al. inclined at an angle with support surfaces extending perpendicularly to the vertical axis, in light of the teachings of Ohsawa, in order to minimize the contact surface on the wafers. Applicant

Art Unit: 3726

should note that the angle of inclination of the teeth of Ohsawa encompasses the claimed range.

For claims 7, 8 and 22, Applicant should note that such wedge-shaped teeth are well known to those of ordinary skill in the art.

For claim 9, see column 3, lines 6-8 of Niemirowski et al.

For claims 17 and 18, Applicant should note that legs formed of quartz or silicon carbide members are old and well known to those of ordinary skill in the art.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niemirowski et al./Ohsawa as applied to claim 4 above, and further in view of Ballance et al. (US Patent 6,395,363).

Niemirowski et al./Ohsawa discloses a support tower as shown above except for the support surfaces being polished. However it is known to polish substrate support surfaces as attested by Ballance et al., see column 2, lines 66-67 and column 3, lines 1-11. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have polished the support surfaces of the support tower of Niemirowski et al./Ohsawa, in light of the teachings of Ballance et al., in order to reduce the tendency of the support to scratch the substrate surface.

4. Claims 2, 3, 11, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemirowski et al./Ohsawa as applied to claims 1 and 15 above, and further in view of Zehavi (US patent 6,225,594).

With regards to claims 2, 11 and 16, Niemirowski et al./Ohsawa discloses a support tower as shown above except for the silicon legs comprising virgin polysilicon. However

Art Unit: 3726

it is known to use virgin polysilicon as legs of a support tower as attested by Zehavi, see column 3, lines 43-45. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used virgin polysilicon for the legs of the support tower of Niemirowski et al./Ohsawa, in light of the teachings of Zehavi, in order to avoid contamination during processing of the wafers.

For claims 3 and 12, Applicant should note that it is within the general knowledge of one of ordinary skill in the art to provide appropriate heat treatment to the virgin polysilicon legs when deemed necessary.

5. Claims 6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemirowski et al./Ohsawa as applied to claims 4 and 14 above, and further in view of Wingo (US patent 6,171,400).

Niemirowski et al./Ohsawa discloses a support tower as shown above except for the support surfaces supporting the wafers at places located at between 69% and 72% of a radius of the wafers. However it is known to support wafers at such places as attested by Wingo, see column 4, lines 53-58. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have designed the teeth of the support tower of Niemirowski et al./Ohsawa such that the wafers are supported at places located at between 69% and 72% of a radius of the wafers, in light of the teachings of Wingo, in order to provide effective support to the wafers.

**Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Essama Omgba whose telephone number is (703) 305-2915. The examiner can normally be reached on M-F (10-7:30) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

eo  
August 23, 2004

**ESSAMA OMGBA  
PRIMARY EXAMINER**

